## REMARKS/ARGUMENTS

Applicants have received and carefully reviewed the Office Action of the Examiner mailed September 8, 2005. Claims 1-34 remain pending, with claims 33-34 being newly presented. The amendments to the claims are believed to be fully supported by the originally specification as filed. Reconsideration and reexamination are respectfully requested.

**Information Disclosure Statement**

On page 10 of the Office Action, the Examiner indicates that the Bucher Johannes reference (US 2002/170786 A1) cited by the Applicant in the August 16, 2005 IDS was not considered because it could not be found. Another copy of the Bucher Johannes reference is enclosed herewith for the Examiner's reference. Applicant respectfully requests that the Examiner consider the Bucher Johannes reference and provide Applicant with an initialed FORM-1449 in due course.

**Rejections under 35 U.S.C. § 102(b)**

In paragraph 2 of the Office Action, the Examiner rejected claims 1-3, 8-9 and 14-17 under 35 U.S.C. §102(b) as anticipated by Hajny et al. (U.S. Patent No. 5,295,562). Although Applicant respectfully disagrees with this rejection, claim 1 has been amended to recite:

> 1. (Currently Amended) An actuator configured to actuate a *water* valve having a valve with a valve stem, the *water* valve adapted to be coupled to a fluid system, the actuator assembly comprising:
>
> a motor configured to drive the valve stem in a first opening direction;
>
> a biasing mechanism for driving the valve stem a second closing direction that is opposite to the first opening direction, wherein the biasing mechanism is adapted to close the valve stem *within a time period that would cause water hammer in the fluid system*; and
>
> a brake for increasing the time period that the biasing mechanism closes the valve stem *by an amount that eliminates water hammer in the fluid system*.

(Emphasis Added). As can be seen, claim 1 recites a water valve that is adapted to be coupled to a fluid system. Hajny et al. do not appear to disclose a *water* valve that is adapted to be coupled to a fluid system. Rather, Hajny et al. appear to relate to an air damper for use in duct work of an HVAC system (see, for example, Hajny et al., column 1, lines 37-46). Hajny et al. also do not appear to disclose a biasing mechanism that is adapted to close the valve stem *within a time period that would cause water hammer in the fluid system*, or a brake for increasing the time period that the biasing mechanism closes the valve stem *by an amount that eliminates water hammer in the fluid system*. In view of the foregoing, claim 1, as amended, is believed to be clearly patentable over Hajny et al. For similar and other reasons, dependent claims 2-8 and 33-34 are also believed to be clearly patentable over Hajny et al.

Dependent claim 33 further recites that the brake increases the time period that the biasing mechanism closes the valve stem to 4 seconds or more. Such an extended time period would be desirable to reduce or eliminate water hammer in a fluid system, but would appear to be very long for an air damper application. In any event, Hajny et al. do not appear to disclose such an element. Thus, for these additional and other reasons, dependent claim 33 is believed to be clearly patentable over Hajny et al.

Dependent claim 34 further recites that the brake is adapted to limit a rotational velocity of the motor only after the rotational velocity of the motor exceeds a threshold speed, wherein the threshold speed is 900 RPMs or less. Again, Hajny et al. do not appear to disclose such an element. Thus, for these additional and other reasons, dependent claim 34 is believed to be clearly patentable over Hajny et al.

Turning now to independent claim 9, which recites:

> 9. (Currently Amended) An actuator assembly configured for securement to a *water* valve having a valve with a valve stem, the actuator assembly comprising:
>
> a gear assembly configured to engage the valve stem;
>
> a motor having an output shaft that is configured to drive the gear assembly in a first direction; and
>
> biasing structure configured to drive the gear assembly in a second direction;

a brake for reducing or limiting rotational velocity of the output shaft of the motor when the biasing structure is driving the gear assembly in the second direction, *the brake is configured to limit the rotational velocity of the output shaft of the motor to less than 1000 RPMs*.

(Emphasis Added). As detailed above, Hajny et al. do not appear to teach or suggest a *water* valve, as recited in claim 9. Rather, Hajny et al. appear to relate to an air damper for use in duct work of an HVAC system (see, for example, Hajny et al., column 1, lines 37-46). In addition, Hajny et al. do not appear to teach or suggest a brake that *is configured to limit the rotational velocity of the output shaft of the motor to less than 1000 RPMs*, as recited in claim 9. For these and other reasons, claim 9 is believed to be clearly patentable over Hajny et al. For similar and other reasons, dependent claims 10-20 are also believed to be clearly patentable over Hajny et al.

In paragraph 3 of the Office Action, the Examiner rejected claims 1, 2 and 4 under 35 U.S.C. §102(b) as anticipated by Weiss et al. (U.S. Patent No. 6,097,123). Claim 1 recites:

1. (Currently Amended) An actuator configured to actuate a *water* valve having a valve with a valve stem, the *water* valve adapted to be coupled to a fluid system, the actuator assembly comprising:

a motor configured to drive the valve stem in a first opening direction;

a biasing mechanism for driving the valve stem a second closing direction that is opposite to the first opening direction, wherein the biasing mechanism is adapted to close the valve stem *within a time period that would cause water hammer in the fluid system*; and

a brake for increasing the time period that the biasing mechanism closes the valve stem *by an amount that eliminates water hammer in the fluid system*.

(Emphasis Added). As can be seen, claim 1 recites a water valve that is adapted to be coupled to a fluid system. Applicant respectfully traverses this rejection. Like Hajny et al., Weiss et al. do not appear to teach or suggest a biasing mechanism that is adapted to close the valve stem *within a time period that would cause water hammer in the fluid system*, and a brake for increasing the time period that the biasing mechanism closes the valve stem *by an amount that eliminates water hammer in the fluid system*. For these and other reasons, claim 1, as amended, is believed to be

clearly patentable over Weiss et al. For similar and other reasons, dependent claims 2-8 and 33-34 are also believed to be clearly patentable over Weiss et al.

In paragraph 4 of the Office Action, the Examiner rejected claims 1, 2, 6, 7, 9, 12-14 and 21 under 35 U.S.C. §102(b) as anticipated by Pasch et al. (U.S. Patent No. 6,021,955). Applicant respectfully traverses this rejection. Like Hajny et al. and Weiss et al. discussed above, Pasch et al. do not appear to disclose a *water* valve that is adapted to be coupled to a fluid system. Rather, Pasch et al. appear to relate to an air damper. In addition, Pasch et al. do not appear to teach or suggest a biasing mechanism that is adapted to close the valve stem *within a time period that would cause water hammer in the fluid system*, and a brake for increasing the time period that the biasing mechanism closes the valve stem *by an amount that eliminates water hammer in the fluid system*. For these and other reasons, claim 1, as amended, is believed to be clearly patentable over Pasch et al. For similar and other reasons, dependent claims 2-8 and 33-34 are also believed to be clearly patentable over Pasch et al.

Turning now to independent claim 9, which recites:

> 9. (Currently Amended) An actuator assembly configured for securement to a *water* valve having a valve with a valve stem, the actuator assembly comprising:
>
> a gear assembly configured to engage the valve stem;
>
> a motor having an output shaft that is configured to drive the gear assembly in a first direction; and
>
> biasing structure configured to drive the gear assembly in a second direction;
>
> a brake for reducing or limiting rotational velocity of the output shaft of the motor when the biasing structure is driving the gear assembly in the second direction, *the brake is configured to limit the rotational velocity of the output shaft of the motor to less than 1000 RPMs*.

(Emphasis Added). As detailed above, Pasch et al. do not appear to relate to a *water* valve, as recited in claim 9. Rather, Pasch et al. appear to relate to an air damper. In addition, Pasch et al. do not appear to teach or suggest a brake that *is configured to limit the rotational velocity of the output shaft of the motor to less than 1000 RPMs*, as claimed. For these and other reasons, claim

9 is believed to be clearly patentable over Pasch et al. For similar and other reasons, dependent claims 10-20 are also believed to be clearly patentable over Pasch et al.

Turning now to independent claim 21, which recites:

> 21. (Currently Amended) A valve assembly, comprising:
> a valve having an open position and a closed position;
> an actuator assembly coupled to the valve, the actuator assembly configured to move the valve between the open position and the closed position;
> wherein the actuator assembly comprises a damping mechanism configured to limit a speed of the valve when the actuator assembly is moving the valve from the open position to the closed position such that the valve moves from the open position to the closed position in 4 seconds or more, but does not significantly limit the speed when the actuator assembly is moving the valve from the closed position to the open position.

As can be seen, claim 21 recites a dampening mechanism that is configured to limit a speed of the valve when the actuator assembly is moving the valve from the open position to the closed position such that the valve moves from the open position to the closed position in 4 seconds or more. Such an extended time period would be desirable to reduce or eliminate water hammer in a fluid system, but would appear to be very long for an air damper application. In any event, Pasch et al. do not appear to disclose such an element. Thus, for these and other reasons, claim 21 is believed to be clearly patentable over Pasch et al.

In paragraph 5 of the Office Action, the Examiner rejected claims 1-3, 8-11, 14, 15, 17, 21-25 and 27-30 under 35 U.S.C. §102(b) as anticipated by Persons (U.S. Patent No. 2,052,987). Applicant respectfully traverses this rejection. Claim 1 recites:

> 1. (Currently Amended) An actuator configured to actuate a *water* valve having a valve with a valve stem, the *water* valve adapted to be coupled to a fluid system, the actuator assembly comprising:
> a motor configured to drive the valve stem in a first opening direction;
> a biasing mechanism for driving the valve stem a second closing direction that is opposite to the first opening direction, wherein the biasing mechanism is adapted to close the valve stem *within a time period that would cause water hammer in the fluid system*; and
> a brake for increasing the time period that the biasing mechanism closes the valve stem *by an amount that eliminates water hammer in the fluid system*.

(Emphasis Added). Persons appears to describe an electric valve control that is configured to prevent a valve from rebounding when closed. Persons appears to be, at best, silent as to water hammer. Moreover, Persons do not appear to disclose a biasing mechanism that is adapted to close the valve stem *within a time period that would cause water hammer in the fluid system*, and a brake for increasing the time period that the biasing mechanism closes the valve stem *by an amount that eliminates water hammer in the fluid system*. In view of the foregoing, claim 1, as amended, is believed to be clearly patentable over Persons. For similar and other reasons, dependent claims 2-8 and 33-34 are also believed to be clearly patentable over Persons.

Turning now to independent claim 9, which recites:

> 9. (Currently Amended) An actuator assembly configured for securement to a *water* valve having a valve with a valve stem, the actuator assembly comprising:
> a gear assembly configured to engage the valve stem;
> a motor having an output shaft that is configured to drive the gear assembly in a first direction; and
> biasing structure configured to drive the gear assembly in a second direction;
> a brake for reducing or limiting rotational velocity of the output shaft of the motor when the biasing structure is driving the gear assembly in the second direction, *the brake is configured to limit the rotational velocity of the output shaft of the motor to less than 1000 RPMs*.

(Emphasis Added). Persons do not appear to teach or suggest a brake that *is configured to limit the rotational velocity of the output shaft of the motor to less than 1000 RPMs*, as claimed. For these and other reasons, claim 9 is believed to be clearly patentable over Persons. For similar and other reasons, dependent claims 10-20 are also believed to be clearly patentable over Persons.

Turning now to independent claim 21, which recites:

> 21. (Currently Amended) A valve assembly, comprising:
> a valve having an open position and a closed position;
> an actuator assembly coupled to the valve, the actuator assembly configured to move the valve between the open position and the closed position;

wherein the actuator assembly comprises a damping mechanism configured to limit a speed of the valve when the actuator assembly is moving the valve from the open position to the closed position such that the valve moves from the open position to the closed position in 4 seconds or more, but does not significantly limit the speed when the actuator assembly is moving the valve from the closed position to the open position.

As can be seen, claim 21 recites a dampening mechanism that is configured to limit a speed of the valve when the actuator assembly is moving the valve from the open position to the closed position such that the valve moves from the open position to the closed position in 4 seconds or more. Persons do not appear to disclose such an element. Thus, for these and other reasons, claim 21 is believed to be clearly patentable over Persons. For similar and other reasons, dependent claims 22-26 are also believed to be clearly patentable over Persons.

Now turning to independent claim 27, which recites:

27. (Currently Amended) A valve assembly, comprising:
a valve having an open position and a closed position;
a valve stem operatively attached to the valve;
a gear assembly configured to engage the valve stem;
a motor configured to drive the gear assembly to the open position; and
one or more springs configured to drive the gear assembly to the closed position;
wherein the motor comprises a damping mechanism for limiting rotational velocity of the motor when the one or more springs are driving the gear assembly to the closed position, wherein the damping mechanism is configured to limit the rotational velocity of the motor only after the rotational velocity of the motor exceeds a threshold speed, *wherein the threshold speed is 1000 RPMs or less*.

For similar reasons to those discussed above with respect to claim 9, as well as other reasons, claim 27 is believed to be clearly patentable over Persons. For similar and other reasons, dependent claim 28 is also believed to be clearly patentable over Persons.

Now turning to independent claim 29, which recites:

29. (Currently Amended) A method of *reducing water hammer caused by operation of a valve*, the method comprising the steps of:
driving the valve to a first position corresponding to an open position at a first speed using a first force;

driving the valve to a second position corresponding to a closed position at a second speed using a second force; and

reducing the second speed by providing a force that counters the second force;

wherein the valve moves from the open position to the closed position *in 4 seconds or more*.

Claim 29 recites a method for reducing water hammer caused by operation of a valve. As noted above, Persons appears to describe an electric valve control that is configured to prevent a valve from rebounding when closed and is, at best, silent as to water hammer. In addition, claim 29 recites that the valve moves from the open position to the closed position *in 4 seconds or more*. As noted above with respect to claim 21, Persons do not appear to disclose such an element. Thus, for these and other reasons, claim 29 is believed to be clearly patentable over Persons. For similar and other reasons, dependent claim 30 is also believed to be clearly patentable over Persons.

**Rejections under 35 U.S.C. § 103(a)**

In paragraph 7 of the Office Action, the Examiner rejected claim 5 under 35 U.S.C. §103(a) as unpatentable over Hajny et al. (U.S. Patent No. 5,295,562) in view of Bellinger (U.S. Patent No. 6,349,253). Applicant respectfully disagrees. Bellinger appears to be directed towards a vehicle braking system. It is unclear how a vehicle braking system is related to the air damper of Hajny et al. Thus, there would appear to be little motivation to combine Hajny et al. and Bellinger in the manner suggested by the Examiner. In addition, and as detailed above, claim 1, from which claim 5 depends, is clearly distinguished from Hajny et al., and Bellinger does not appear to teach what Hajny et al. lacks. Thus, for similar and other reasons, dependent claim 5 is believed to be clearly patentable over Hajny et al. in view of Bellinger.

In paragraph 8 of the Office Action, the Examiner rejected claims 18-20 under 35 U.S.C. §103(a) as unpatentable over Hajny et al. (U.S. Patent No. 5,295,562) in view of Persons (U.S. Patent No. 2,052,987). Applicant respectfully traverses this rejection. As detailed above, claim 9, from which claims 18-20 depend, is clearly distinguished from Hajny et al., and Persons does

not appear to teach what Hajny et al. lacks. Thus, for these and other reasons, dependent claims 18-20 are believed to be clearly patentable over Hajny et al. in view of Persons.

In paragraph 9 of the Office Action, the Examiner rejected claim 26 under 35 U.S.C. §103(a) as unpatentable over Persons (U.S. Patent No. 2,052,987) in view of Pasch et al. (U.S. Patent No. 6,021,955). Applicant respectfully traverses this rejection. As detailed above, claim 21, from which claim 26 depends, is clearly distinguished from Persons, and Pasch et al. does not appear to teach what Persons lacks. Thus, for these and other reasons, dependent claim 26 is believed to be clearly patentable over Persons in view of Pasch et al.

In paragraph 10 of the Office Action, the Examiner rejected claims 31 and 32 under 35 U.S.C. §103(a) as unpatentable over Persons (U.S. Patent No. 2,052,987). The Examiner asserts that the claimed methods are nothing more than what a trained mechanic does. Applicant must respectfully disagree.

Claim 31 recites:

> 31. (Currently Amended) A method of reducing water hammer in a fluid system caused by a previously installed water valve assembly that includes a valve and an actuator assembly, the actuator assembly including a first motor adapted to move the valve from a first position to a second position, and a return mechanism that is configured to return the valve to the first position at a return speed; the method comprising steps of:
>
> removing the actuator assembly; and
>
> installing a replacement actuator assembly that includes a second motor that includes a motor housing having an inside surface and a brake disposed in the motor housing, the brake being configured to engage at least part of the inside surface of the motor housing to slow the return speed of the second motor such water hammer is eliminated in the fluid system.

(Emphasis Added). As can be seen, claim 31 recites installing a replacement actuator assembly that includes a second motor that includes a motor housing having an inside surface and a brake disposed in the motor housing, the brake being configured to engage at least part of the inside surface of the motor housing to slow the return speed of the second motor such water hammer is eliminated in the fluid system. As detailed above, Persons appears to describe an electric valve

control that is configured to prevent a valve from rebounding when closed, and is, at best, silent with respect to water hammer.

In addition, Persons does not appear to describe a motor that can be easily replaced with a second motor that includes a brake, and in particular, a brake that is disposed in the motor housing and configured to engage at least part of the inside surface of the motor housing. Instead, Persons appears to describe a shaft (34) that extends outwardly from motor (36) and into a drum (41). An S-shaped spring (42) bearing friction blocks (40) is mounted on the shaft (34), within the drum (41). Thus, Persons does not appear to describe a brake that is disposed in the motor housing or "that is configured to engage at least part of the inside surface of the motor housing", as recited in claim 31.

Moreover, Persons does not appear to describe or suggest an actuator that lends itself to easy motor replacement. Simply replacing Persons' motor, as suggested by the Examiner, would not provide or result in the recited brake, as Persons describes a motor that relies upon a separate brake (e.g. Drum 41). For these and other reasons, claim 31 is believed to be clearly patentable over Persons. For similar and other reasons, independent claim 32 is also believe to be clearly patentable over Persons.

Reconsideration and reexamination are respectfully requested. It is submitted that, in light of the above remarks, all pending claims 1-34 are now in condition for allowance. If a telephone interview would be of assistance, please contact the undersigned attorney at 612-359-9348.

Respectfully submitted,

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(54) **ACTUATOR WITH A CENTRIFUGAL BRAKE**

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(52) **U.S. Cl.** ..... **188/185**

(57) **ABSTRACT**

An operating mechanism for operating an actuating member is provided with an electric motor (11, 12), a resetting spring (3) and a centrifugal brake (20), wherein the actuating member can be operated in a first direction of movement by the electric motor (11, 12) activated by means of a control or regulating device, and in a second direction of movement by means of the resetting spring (3). In accordance with the invention, a brake body (22) of the centrifugal brake (20) is arranged on the rotor (12) of the electric motor (11, 12). The centrifugal brake (20) arranged directly on the rotor (12) can be configured such that a braking effect is generated only when the actuating member is operated by the resetting spring (3). When operated by the switched-on electric motor (11, 12), on the other hand, the centrifugal brake (20) has no braking effect. By means of the centrifugal brake (20) the speeds that can be reached are limited to the extent that no spurious vibrations and noises occur.

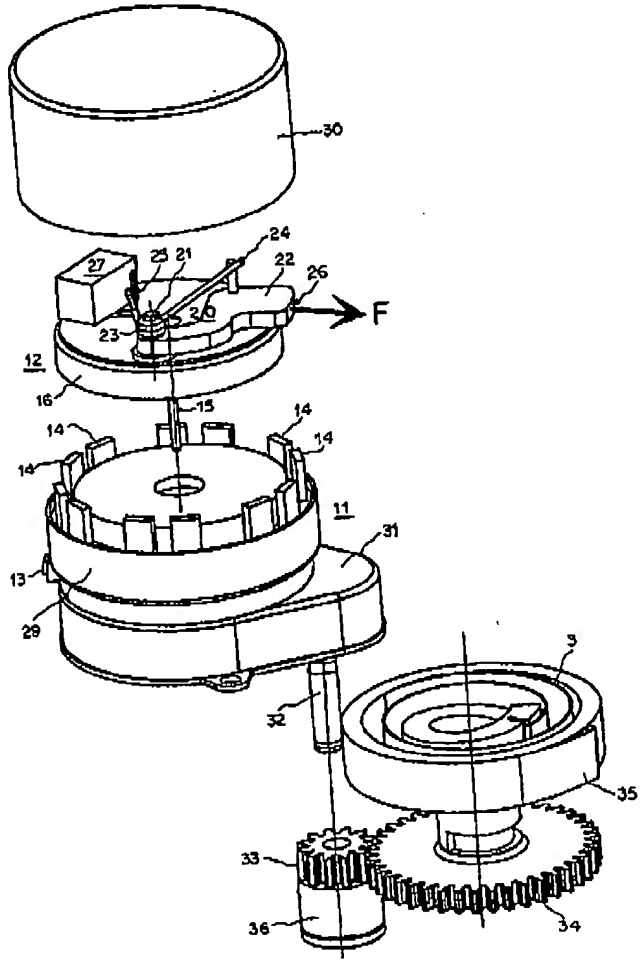
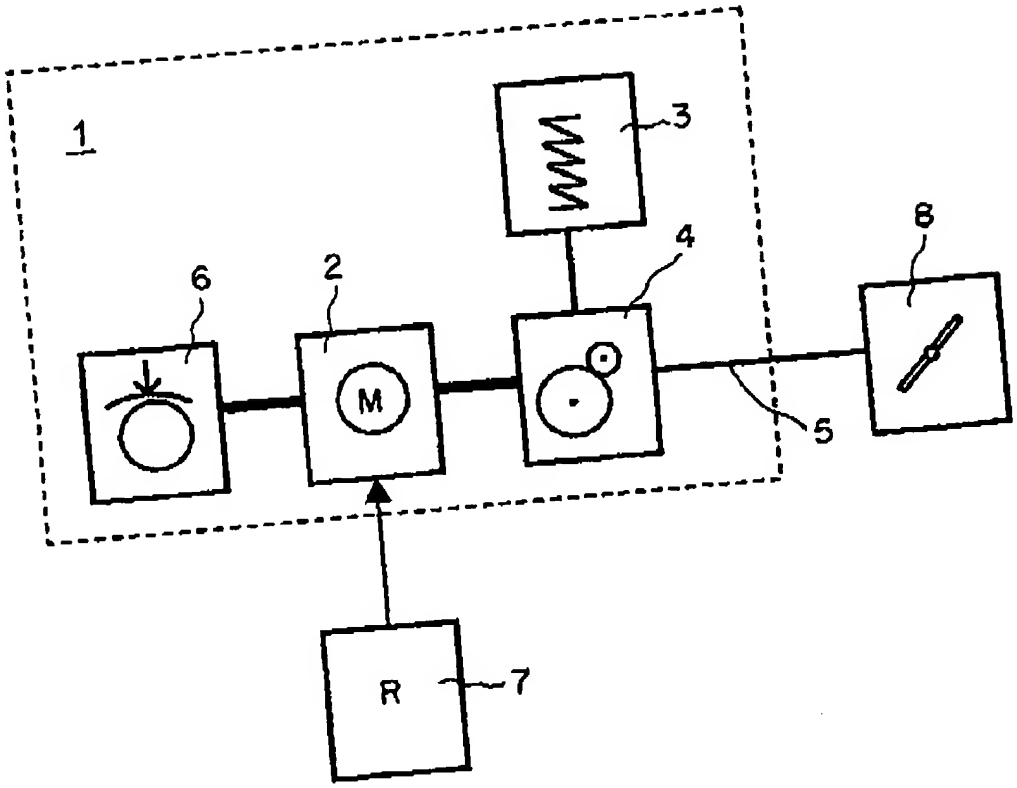


Fig. 1



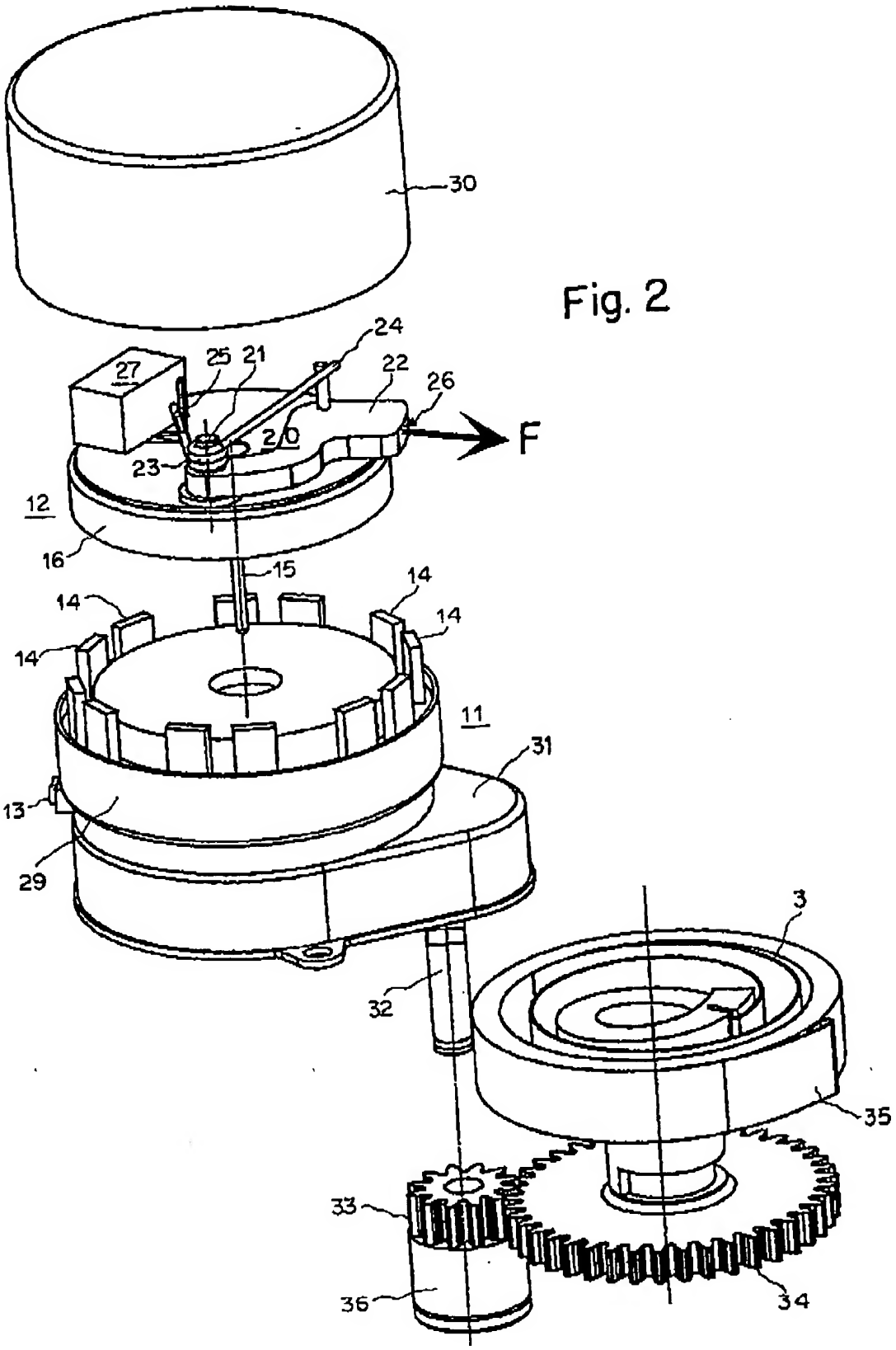

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Fig. 2

Fig. 3

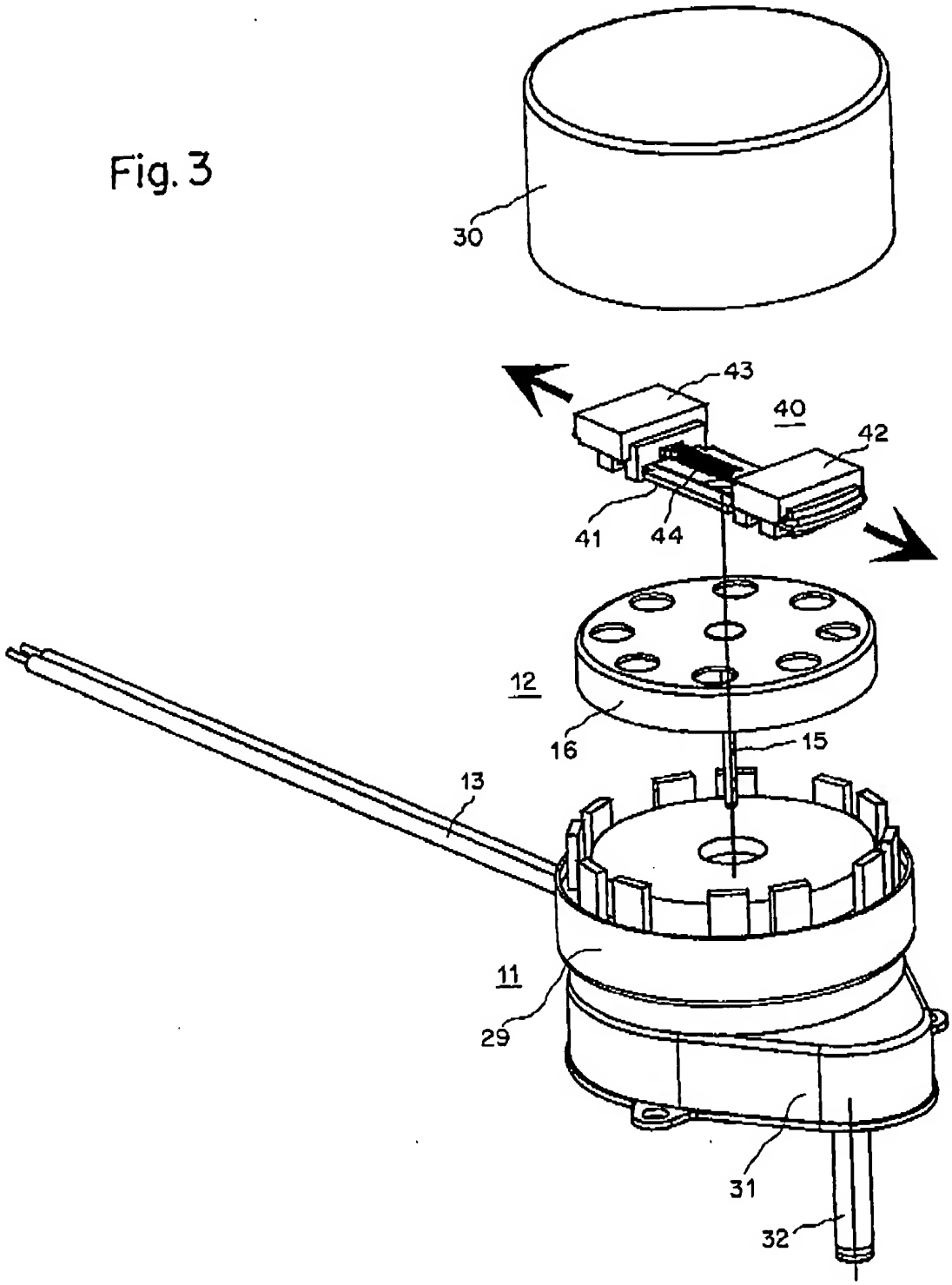
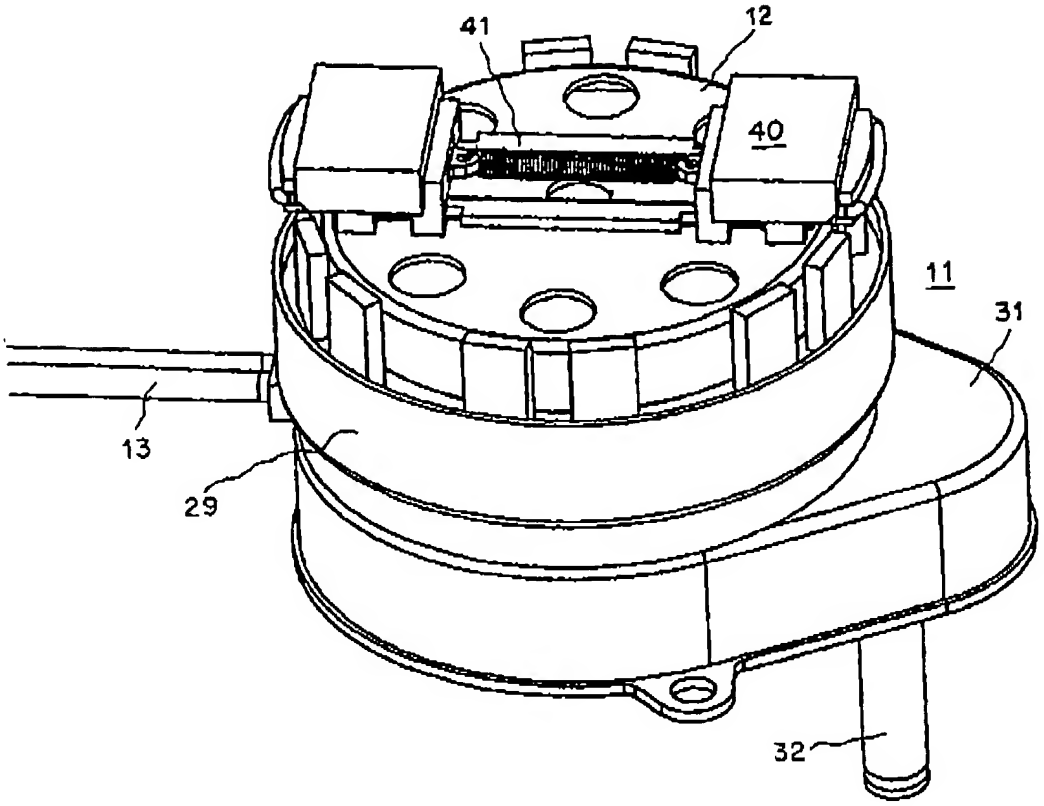


Fig.4



# ACTUATOR WITH A CENTRIFUGAL BRAKE

## BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The invention relates to an actuator, and furthermore to an actuating member with the actuator and to an electric motor.

[0003] An operating mechanism of this type is advantageously used in heating, ventilation and air-conditioning systems for operating actuating members such as valves or gates and the like. An electric motor of the operating mechanism is controllable, for example, with a two-position controller, wherein the electric motor is switched on in the "on" state, and the actuating member is operated in a first direction counter to the force of a resetting spring. In the "off" state, the electric motor is switched off so that the resetting spring operates the actuating members counter to the first direction.

[0004] 2. Description of the Prior Art

[0005] Known operating mechanisms of this type have the disadvantage that, when the electric motor is in the switched off state, relatively high speeds are generated by the resetting spring in the operating mechanism, due to which spurious mechanical vibrations and noises in particular occur.

[0006] A centrifugal brake for actuators with a resetting function is known from EP 297 453 A1, which can be coupled to a journal of a reduction stage. Damage to the actuator when a resetting spring is released is prevented by means of the centrifugal brake.

## SUMMARY OF THE INVENTION

[0007] The object of the invention is to provide an actuator wherein a certain speed is not exceeded, so spurious mechanical vibrations and noises are prevented, and by means of its design takes up as little space as possible.

[0008] According to a first aspect of the present invention, there is provided an operating mechanism for operating an actuating member, comprising an electric motor provided with a rotor, an energy store and a centrifugal brake, wherein the actuating member can be operated in a first direction of movement by means of the switched-on electric motor and in a second direction of movement by means of the energy store, and a brake body of the centrifugal brake is arranged on the rotor of the electric motor.

[0009] According to a second aspect of the present invention, there is provided an actuating member with an operating mechanism in accordance with the first aspect of the invention.

[0010] According to a third aspect of the present invention, there is provided a synchronous motor for an operating mechanism for operating an actuating member, comprising a rotor upon which a brake body of a centrifugal brake is arranged.

[0011] According to a fourth aspect of the present invention, there is provided an electric motor for an operating mechanism in accordance with the first aspect of the invention.

[0012] Advantageous configurations will be evident from the dependent claims.

## BRIEF DESCRIPTION OF THE DRAWINGS

[0013] Embodiments of the invention will hereinafter be described in more detail with reference to the drawings.

[0014] There is shown, in:

[0015] FIG. 1 a schematic representation of an actuator with function blocks,

[0016] FIG. 2 an exploded diagram of the actuator,

[0017] FIG. 3 an exploded diagram of a variation of the actuator, and

[0018] FIG. 4 a part of the variation of the actuator in the assembled state.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0019] In FIG. 1, 1 denotes an actuator that is provided with an electric motor 2, a resetting spring 3 acting as a mechanical energy store, a gearing 4, a transmission element 5 and a centrifugal brake 6. The electric motor 2 can be switched on and off by means of a controlling or regulating device 7, wherein the controlling or regulating device is implemented, for example, as a two-position controller, but in the simplest instance by means of an electric switch.

[0020] The actuator 1 serves to operate an actuating element 8 that is connected for this purpose to the transmission element 5 of the actuator 1. The actuating member 8 is, for example, a valve or a gate.

[0021] The electric motor 2, the resetting spring 3 and the transmission element 5 are mechanically coupled and connected to one another via the gearing 4 such that the actuating member 8 connected to the transmission element can be operated in a first direction of movement by the electric motor 2 activated by means of the controlling or regulating device 7, and in a second direction of movement by means of the resetting spring 3. The resetting spring 3 is loaded by the switched-on electric motor 2 when the actuating member 8 is operated in a first direction of movement.

[0022] The gearing 4 is advantageously configured such that at least one reduction stage is effective between the electric motor 2 and the transmission element 5, and also between the electric motor 2 and the resetting spring 3.

[0023] Advantageously, the gearing 4 operates as a support from the point of view of the electric motor 2, such that the required forces can be obtained on the actuating member 8, wherein the greatest angular velocities occur on the rotor of the electric motor 2. According to the invention, the centrifugal brake 6 is arranged on the rotor of the electric motor 2, so that the centrifugal brake 6 is moved with the angular velocity of the rotor. Because the gearing 4 acts as a support from the point of view of the electric motor 2, the centrifugal brake 6 is adjustable—advantageously with the aid of an appropriately dimensioned priming spring—such that a braking action only occurs when the actuating member 8 is operated in the second direction of movement, that is to say operated by the resetting spring 3. On the other hand, for the first direction of movement, that is to say when the actuating member 8 is operated by the electric motor 2, the centrifugal brake 6 is advantageously configured such that no braking action occurs.

[0024] The electric motor 2 is preferably a synchronous motor so that when in the switched-on state there is a constant speed whereby the temporal behaviour of an actuating motion in the first direction of movement is exactly defined.

[0025] In a typical configuration of the actuator, the speed of the rotor can be, for example, 500 revolutions per minute when the resetting spring is loaded. When the loaded resetting spring returns to the switched off state of the electric motor, the rotor speed is limited by the centrifugal brake to approximately 1000 revolutions per minute, whereas without the centrifugal brake typically several thousand revolutions per minute would be reached, which would cause spurious vibrations and noises.

[0026] In FIG. 2, 11 designates a stator and 12 a rotor of the electric motor (FIG. 1). The stator 11 has electrical connections 13 and several poles 14 for a magnetic rotating field. The rotor 12 is, for example, a rotor disc arranged in a rotatable manner with a rotor shaft 15 and with an edge 16 on the inner side of which magnetic rotor poles, not shown in the drawing, are arranged.

[0027] The centrifugal brake 6 (FIG. 1) is arranged in accordance with the invention on the rotor 12 and connected to the rotor 12. In a first variation of an embodiment 20, the centrifugal brake is provided with a brake body 22 arranged in a pivotable manner about a bearing mandrel 21, wherein the bearing mandrel 21 is arranged eccentrically upon the rotor 12. Advantageously the brake body 22 is coupled to a priming spring 23. The priming spring 23 is configured and arranged primed such that brake body 22 can only be pivoted away counter to the force of the priming spring 23 by means of a centrifugal force F acting upon the braking body 22 once there is a certain angular velocity $\omega_s$ of the rotor.

[0028] The priming spring 23 is implemented, for example, as a leg spring that is arranged on the bearing mandrel 21, wherein a first limb 24 of the leg spring engages with the brake body 22, and a second limb 25 with the rotor 25.

[0029] Advantageously, the brake body 22 is provided with a brake liner 26 that is arranged in the region of the contact surface between the brake body 22 and a brake drum 30.

[0030] The rotor 12, configured asymmetrically with respect to the axis of the rotor shaft 15 in particular by means of the brake body 22, is advantageously balanced by means of a balancing weight 27 shown schematically in FIG. 2.

[0031] A particularly simple and space-saving design of the actuator 1 can be obtained when the brake drum 30 is at the same time a part of the covering of the electric motor 2, by means of which the rotor 12 and the centrifugal brake 20 can be covered. The brake drum 30 advantageously configured as a cover is, for example, fixed to a stator cover 29.

[0032] A gearbox 31 connected to the stator 11 is provided with a rotor shaft 15 with a reduction stage of the gearing 4 (FIG. 1) coupling an output shaft 32.

[0033] The resetting spring 3, implemented, for example, as a coil spring, is in this case coupled via a further reduction stage of the gearing 4 (FIG. 1) provided with a pinion and a toothed wheel, wherein the pinion 33 is connected with the output shaft 32. One end 35 of the resetting spring 3 is advantageously connected to the gearbox 31.

[0034] The transmission element 5 (FIG. 1) is implemented, for example, by the output shaft 32 or by a hub 36 mounted on the output shaft 32.

[0035] The variation of the actuator shown in FIG. 3 shows functional elements already described hereinabove of the actuator 1 such as the stator 11 with the electrical connections 13 and the stator cover 29, the gearbox 31 with the output shaft 32, the rotor 12 with the rotor shaft 15 and the edge 16 and the brake drum 30.

[0036] A second variation 40 of an embodiment of the centrifugal brake 6 (FIG. 1) is connected in accordance with the invention to the rotor 12. The centrifugal brake 40 is provided with a guide rail 41 and brake bodies 42 and 43 arranged in a slideable manner on the guide rail 41, which brake bodies are primed by means of a tension spring 44 and are coupled to one another. The tension spring 44 is configured and arranged primed such that the brake bodies 42 and 43 are pressed by means of a centrifugal force acting upon the brake bodies 42 and 43 onto the brake drum 30 only once there is a certain angular velocity $\omega_s$ of the rotor.

[0037] Because the centrifugal brake 6 and respectively 20 and respectively 40 (FIG. 4) is arranged directly on the rotor 12, limiting of the speed of the electric motor 2 to a value below a threshold at which spurious vibrations and noises occur is made possible. In addition a space-saving design of the actuator 1 is made possible.

[0038] In selecting the material for the centrifugal brake 6 and respectively 20 and respectively 40, care should be taken that the magnetic manner of operation of the rotor 12 is not disturbed by the material of the centrifugal brake 6 and respectively 20 and respectively 40, and the arrangement thereof on the rotor 12.

I claim:

1. Operating mechanism for operating an actuating member, comprising an electric motor provided with a rotor, an energy store and a centrifugal brake, wherein the actuating member can be operated in a first direction of movement by means of the switched-on electric motor and in a second direction of movement by means of the energy store, and a brake body of the centrifugal brake is arranged on the rotor of the electric motor.

2. Operating mechanism according to claim 1, wherein a part of the covering of the electric motor is configured as a brake drum of the centrifugal brake.

3. Operating mechanism according to claim 1, wherein the operation of the actuating member is guided in the first direction of movement by means of at least one reduction stage.

4. Operating mechanism according to claim 1, wherein the energy store is implemented by a spring that can be tensioned in the first direction of movement by the electric motor when the actuating member is operated.

5. Operating mechanism according to claim 4, wherein the spring is mechanically coupled via at least one reduction stage with the electric motor.

6. Actuating member with an operating mechanism according to claim 1.

7. Synchronous motor for an operating mechanism for operating an actuating member, comprising a rotor upon which a brake body of a centrifugal brake is arranged.

8. Electric motor for an operating mechanism according to claim 1.

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